Current Practice

FORENSIC MEDICINE AND TOXICOLOGY

Drug Addiction

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During the past ten years there has been a change in the pattern of drug addiction in the United Kingdom. Before 1950 there was relatively little, and virtually none among people who had obtained drugs illicitly. Now cannabis, amphetamines, combinations of amphetamines and barbiturates, lysergic acid diethylamide, cocaine, and heroin are all increasingly obtained illegally. Those who start obtaining drugs illicitly, and become addicted, commonly have a severe personality disorder. They may experiment with any drugs they can obtain.

Sources of Drugs

Heroin and cocaine, each of which has been sold for £1 for 60 mg. for the past ten years, appear to originate from legitimate prescriptions for other addicts who do not always use the amount prescribed. Cannabis (marihuana), commonly known as "pot," "weed," or "hemp," is increasingly widely smoked, and not only by recent immigrants. People generally smuggle it into the country in small amounts for themselves and their friends, though some appears to be smuggled for profit.

Amphetamines and amphetamine-barbiturate combinations are sold widely in capsule and tablet form for 1s. to 2s. each in cafés under such names as "purple hearts," "french blues," or "black bombers." The price is higher at weekends when the demand by young people to become "high" or "blocked" is greater. These have probably been stolen in bulk or otherwise diverted at some stage after manufacture. The current source of L.S.D. is less certain, but until very recently it was legal both to import and to possess the drug.

Control of Drugs

The control of drugs which are liable to be misused is carried out on behalf of the Home Secretary and of the Secretary of State for Scotland by inspectors and other officers. There is a widespread belief that there is a group of addicts who have become "registered," and thus entitled to an indefinite free supply of drugs. This myth is widely fostered by addicts themselves, who often tell doctors that they are "registered," implying that they are entitled to have drugs.

Drugs controlled under the existing Dangerous Drugs Acts may in fact be prescribed by any registered medical practitioner for anyone, and the Home Office index or register is only a list of persons known to be addicted to narcotic drugs. This is chiefly compiled from the routine inspections by the police of retail pharmacists' registers. When, after investigation, cases of drug addiction are found the names are added to the index. The police notify all cases of drug addiction they find, and prisoners who are addicts are also reported. The Home Office also obtains some information from hospitals, doctors, social workers, and similar sources.

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Drug Dependence

The new term "drug dependence" is a general term applicable to all types of drug abuse. It is a state of psychic or physical dependence, or both, which may arise after long-term administration of a drug. Describing the type of dependence is an integral part of the new terminology (morphine-type, cannabis-type, amphetamine-type).

TABLE I.—*Summary of Statutory Provisions for Control of Drugs*

	Dangerous Drugs Act (1965) and Dangerous Drugs (No. 2) Regulations (1964)	Drugs (Prevention of Misuse) Act 1964	Pharmacy and Poisons Act 1933, Poisons List Order 1966, and Poisons Rules 1966
Drugs controlled	Opiates Morphine Heroin* Methadone Synthetic analgesics Pethidine, etc. Cocaine* Cannabis*	Amphetamines* and some similar substances Lysergic acid diethylamide (L.S.D.25)* and some similar substances, including mescaline	Barbiturates Many other substances are controlled under these provisions, including drugs controlled under the Dangerous Drugs Act and the Drugs (Prevention of Misuse) Act
Main provisions	(*a*) Offence to possess without authority	(*a*) Offence to possess without authority	(*a*) No offence to possess without authority, but substances in Schedule IV may be sold only by an "authorised seller of poisons" on a prescription from a duly qualified practitioner
	(*b*) Drugs to be kept under lock and key by authorized persons	(*b*) Drugs need not be kept under lock and key	(*b*) Drugs need not be kept under lock and key
	(*c*) Authorized persons have to keep records of drug movements	(*c*) Authorized persons need not keep records of drug movements	(*c*) No records of drug movements, except private prescriptions, have to be copied in prescription book
	(*d*) Offence to import and export except under licence	(*d*) Offence to import except under licence	(*d*) No restrictions on import or export
Penalties	Summary—£250 fine and/or 12 months' imprisonment Indictment—£1,000 fine and/or 10 years' imprisonment	Summary—£200 fine and/or 6 months' imprisonment Indictment—unlimited fine and/or 2 years' imprisonment	£50 fine

* Drugs commonly obtained illegally.

People can become dependent on a wide variety of chemical substances that produce central nervous system effects varying from stimulation to depression. When psychic dependence develops there is a feeling of satisfaction and a drive that requires periodic or continuous use of the drug to produce pleasure or avoid discomfort ("craving"). Some drugs also produce physical dependence, which is an adaptive state that shows itself by intense physical disturbances when the drug

is stopped or its action affected by a specific antagonist (withdrawal or abstinence syndromes).

Marihuana

Marihuana is found in this country either as clippings from the dried flowering or fruiting tops of the cannabis plant or in the form of a resin extracted from it, often referred to as "hash," and a more potent source of the active ingredients (probably tetrahydrocannabinols).

When marihuana is smoked there is initially apparent stimulation and exhilaration, followed by sedation, depression, drowsiness, and sleep. The effects, however, are very variable and unpredictable. The neurophysiological effects are clumsiness, incoordination, and frequently ataxia. There may be analgesia of the skin, flushing of the face, pupillary dilatation, and a rise in the pulse rate and blood pressure.

The effects on mood vary from extreme elation and exhilaration to depression, panic, and severe anxiety. In general marihuana promotes a sense of well-being and relaxation. Anxiety and emotional tension may be reduced and critical faculties inhibited. It may induce striking illusions and hallucinations. The distortion of time perception is especially marked, and time appears to pass more slowly. Fantasy and imagination may be stimulated. Ideas may be plentiful but disconnected and disorganized. There may be increased auditory acuity and sensitivity to rhythm. Listening to music after taking the drug may produce unusual aesthetic responses. In general the drug produces an alteration in consciousness and an altered way of feeling and reacting to sensory stimuli. Marihuana is less effective as an analgesic than the opiates and produces less euphoria. Physical dependence does not develop. Like alcohol, but producing more euphoria, it is sought chiefly for casual recreational use and as an escape from reality. The experiences are often described as being "blocked" or "stoned."

The use of marihuana does not in itself cause any mental or physical ill health, though it may lead to social and legal problems. For example, it can be extremely dangerous to drive a car under the influence of marihuana, owing to altered perception.

Amphetamines

Amphetamines and amphetamine-barbiturate compounds are usually taken at weekends by adolescents to produce euphoria and wakefulness, and to increase energy and talkativeness. Occasional weekend use has been called "benign" compared with a "malignant" use, where psychological dependence on amphetamines has developed.

People in this group take more, and are inclined to use a variety of forms of amphetamine in a reckless manner. They start taking the drug during the week as well as the weekend, and their physical health and work suffer. They often have short-lived mental illnesses, which may lead to hospital admission because of agitation, restlessness, and schizophrenic-like psychoses, frequently with persecutory ideas. They may develop depressive reactions ("coming down") when they stop the drug. These are sometimes described as "the horrors" (though this term is also used for the acute psychotic illnesses).

Amphetamines may be taken intravenously by heroin addicts as an alternative to cocaine. Psychological dependence on amphetamine is also seen in patients who first have it prescribed as an antidepressant or appetite suppressant.

Lysergic Acid Diethylamide

Short-lived psychoses are also seen in people who have taken the drug lysergic acid diethylamide (L.S.D.25). It is a potent drug which one would have thought unlikely to be widely misused, because tolerance often develops rapidly while dependence (psychological or physical) does not develop. Also its effects are uncertain and can be exceedingly unpleasant. Nevertheless, it is now widely used (or misused) in the United States and to some extent here. The view that L.S.D. is harmless and safe is not supported by the figures of untoward reactions. Common complications are psychotic reactions with hallucinations, anxiety—which can amount to severe panic—depression, and confusional episodes with disorientation. These may occur at the time the drug is taken, and may sometimes recur, particularly under stress, for several weeks after. Judgement may be so disordered that a person may believe that it is possible and safe to float down from a height.

A patient with acute adverse reactions should be admitted to hospital and treated with intramuscular chlorpromazine.

Heroin and Cocaine

Drug addiction of the morphine type is more serious, because it is more difficult to treat. It is seen increasingly frequently among young people who take heroin, usually combined with cocaine, by intravenous self-administration ("main-lining"). The common pattern is for someone who has previously taken other drugs to experiment with heroin, taking it occasionally subcutaneously or intramuscularly ("skin-" or "joy-popping"). He then takes it more regularly, and finally daily and intravenously. Physical dependence is likely to develop at this stage and may parallel the development of tolerance. When an addict cannot afford enough of the drug to avoid withdrawal symptoms he may try to get drugs prescribed for him by explaining his predicament to a doctor, who (if he believes that maintenance of the addiction is the best treatment) may do so.

Heroin addicts may also seek treatment for a physical illness. Unsterile self-injection with shared syringes can lead to serum hepatitis, multiple abscesses, subacute bacterial endocarditis, or septicaemia. A common emergency is an overdose, and this is the commonest cause of death.

Though the treatment of an overdose is straightforward (resuscitation: artificial respiration, cardiac massage) there are some special problems. If morphine antagonists (such as nalorphine) are used as an antidote the patient will have severe abstinence symptoms when he recovers consciousness, and a further dose of the opiate may be needed to counteract withdrawal. This is clearly undesirable when treating overdosage. Many of these patients have taken cocaine simultaneously, and this may cause ventricular fibrillation. Addicts who take cocaine may also develop short-lived psychoses similar to amphetamine psychoses.

Addicts are apt to be untruthful. The story of a person who states that he is a heroin addict "registered" at the Home Office, that his own doctor is on holiday, and that he is suffering from withdrawal symptoms should be checked. If there are multiple antecubital puncture marks, abscess sites, and tattooing of the veins it is probable that intravenous heroin has been taken. If drugs have been prescribed it is possible, by contacting either the drugs department of the Home Office or the doctor who prescribed or the chemist who dispensed the drug, to confirm what has been prescribed or dispensed.

Treatment of Withdrawal Symptoms

The early signs of opiate withdrawal are craving for drugs, anxiety, restlessness, and running of the nose. These and more serious abstinence signs are shown in Table II. The symptoms are unpleasant but not usually dangerous, and their onset is gradual. It is unnecessary to give heroin immediately to every addict who demands it, and it is always undesirable to give a prescription to an addict who has not been seen before. Treatment is indicated for a known physically dependent addict

who is genuinely distressed, has not had any heroin for at least six hours, and is developing withdrawal symptoms. Treatment should be in hospital if possible.

TABLE II.—*Times of Appearance of Abstinence Signs in Physically-dependent Opiate Addicts**

Grade of Abstinence	Signs	Hours After Last Dose		
		Heroin	Morphine	Methadone
0	Craving for drugs, anxiety	4	6	12
1	Yawning, perspiration, running nose, lacrimation	8	14	34–48
2	Increase in above signs plus mydriasis, gooseflesh (piloerection), tremors (muscle twitches), hot and cold flushes, aching bones and muscles, anorexia	12	16	48–72
3	Increased intensity of above plus insomnia, increased blood pressure, increased temperature, increased respiratory rate and depth, increased pulse rate, restlessness, nausea	18–24	24–36	
4	Increased intensity of above plus febrile facies, position (curled up on hard surface), vomiting, diarrhoea, weight loss, spontaneous ejaculation or orgasm, haemoconcentration, leucocytosis, eosinopenia, increased blood sugar	24–36	36–48	

* Modified from a Table by P. H. Blachly, *Amer. J. Psychiat.*, 1966, **122**, 742.

There is no physical dependence on cocaine, so there is no need ever to prescribe or administer it. Heroin withdrawal symptoms can be treated equally well with morphine or methadone (Physeptone). The best way is to use oral methadone, preferably in linctus form so that the patient does not know the amount he is given.

The equivalent in other opiates of methadone 1 mg. are: heroin 1 mg.; morphine 3 mg.; pethidine (meperidine) 20 mg.; codeine 30 mg.; and laudanum (1% morphine) 0.3 ml.

Methadone itself is a drug of addiction and physical dependence to it develops, but withdrawal symptoms are milder. In a doubtful case methadone 10 mg. could be given, and 20 mg. an hour later if there is no improvement. This could be repeated after a further two hours, but 50 mg. should be adequate to cover the next 12 hours, while other arrangements for treatment were made.

Some patients may be dependent on more than one drug. Some take all their prescribed heroin in the morning and barbiturates in the afternoon and evening, when heroin withdrawal symptoms occur. After a time physical dependence on barbiturates develops.

Addicts overstate the dose of opiates they take and underestimate sedatives. A heroin addict can die from inhalation of vomit during a fit from barbiturate withdrawal while being treated for heroin withdrawal symptoms, if concurrent physical dependence on barbiturates is not suspected. Where large amounts of heroin have definitely been taken more methadone will be needed.

Barbiturates

Physical dependence on barbiturates may be found in alcoholics as well as heroin addicts. It may also be found in those who take large amounts of amphetamine-barbiturate combinations. The commonest cause, however, is excessive prescribing of barbiturates as sleeping tablets. The effects of large doses include ataxia, dysarthria, impairment of mental function, confusion, loss of emotional control, poor judgement, and, occasionally, a toxic psychosis. Coma and death may occur.

When physical dependence on barbiturates has developed and the drug is suddenly stopped, the withdrawal symptoms include, in the approximate order of appearance, anxiety, involuntary twitching of the muscles, tremor of hands and fingers, progressive weakness, dizziness, distortion in visual perception, nausea, vomiting, insomnia, loss of weight, a precipitate drop in blood pressure on standing, convulsions of a grand mal type, and a delirium resembling alcoholic delirium tremens or a major psychotic episode. Convulsions and delirium do not usually occur at the same time. Generally a patient may have one or two convulsions during the first 48 hours of withdrawal and then become psychotic during the second or third night.

The barbiturate withdrawal syndrome is best treated in hospital with barbiturates alone. The degree of tolerance must first be determined, by systematically adjusting dosage until intoxication develops, to prevent the development of convulsions from premature withdrawal. Next the physical dependence must gradually be decreased. Physical dependence on barbiturates and other sedative hypnotics (glutethimide, diazepam, chloral) is more severe and dangerous than opiate dependence, and more easily overlooked.

ANY QUESTIONS?

We publish below a selection of questions and answers of general interest.

Pigmented Naevi in Children

Q.—*Three days after surgical excision of a non-malignant pigmented naevus a child aged 6 developed 10 small pigmented naevi over her trunk. Is this unusual or significant?*

A.—Melanocytic naevi are common skin tumours and tend to appear clinically during infancy and childhood. It is tempting to suggest that in the case in question the 10 pigmented naevi had escaped detection before operation, but they might well have become manifest rather rapidly during an active phase of pigmentation. Whether the "stress" of minor surgery had accelerated this process is a matter for speculation.

The occurrence is unusual but not of any sinister significance, since malignant change in a pigmented naevus is an extreme rarity before puberty. A comprehensive review of juvenile melanoma can be found in the *Year Book of Dermatology*.[1]

REFERENCE

[1] Kopf, A. W., and Andrade, R., *Year Book of Dermatology, 1965–66*. Chicago.

Smallpox Vaccination and D.T.P.

Q.—*It is now recommended that D.T.P. and oral polio vaccine be given at the age of 2 to 6 months, and that a booster dose of these prophylactics should be given at 18 months. Is it advisable to vaccinate against smallpox when giving the booster doses at 18 months?*

A.—Simultaneous administration of D.T.P. and live smallpox vaccines does not affect the antibody response to the diphtheria, tetanus, or smallpox vaccines, but the small risk of encephalitis, which is associated with both pertussus and smallpox vaccines, may be greatly increased if they are given at the same time. It is therefore advisable to allow at least three weeks to elapse between the administration of D.T.P. and smallpox vaccines.

Insulin by Aerosol

Q.—*Has the possibility of administering insulin by metered aerosol inhalation been explored?*

A.—I am not aware of any recent work on administration of insulin by aerosol. Such routes as the oral, lingual, nasal, vaginal, and rectal have been tried,[1 2] but, though absorption of insulin was demonstrated in some cases, none has proved an acceptable alternative to the parenteral route. Nasal and pulmonary absorption could not be unequivocally proved.[2]

REFERENCES

[1] Brahn, B., *Lancet*, 1940, 1, 829.
[2] *Brit. med. J.*, 1942, 1, 585.